Procedural Check List for HCS-3 Freeway Analysis

Open HCS-3.
Click on the *Freeways* button.
Click on the *New* button.
Choose Operations or Design.

- Operational Analysis: Determines the *LOS* from lane and volume information.
- Design Analysis: Determines the fewest number of *lanes* required to achieve a selected LOS given volume information.

In most cases, check the Planning Data box. Click *OK*.
Enter the general information.
Enter the AADT, K (DHV) and D (total, not per lane).
Enter the PHF = 0.90.
For Operations Analysis only, enter the Number of Lanes per direction.
Enter Terrain Type.
Enter % Trucks and Buses (remember to divide the statewide percentages by two.)
Enter % RVs = 0.
Enter f_P = 1.00.
Select Ideal, FFSi.
Enter Free Flow Speed (70 mph for urban, 75 mph for rural.)
Enter Lane Width (normally 12 feet.)
Enter Lateral Clearance (normally 6 feet.)
Enter Interchange Density

Interchange Density is the number of interchanges per mile, determined over a six-mile section of freeway (3 miles upstream and 3 miles downstream) in which the freeway section being analyzed is located. An interchange must have at least one on-ramp.

For Operations Analysis only, enter the Number of Lanes per direction.
Check the Rural Freeways box if it is a rural freeway section.
For Design Analysis only, Enter Desired Level of Service.
Print Analysis.

Procedural Check List for HCS-3 Weaving Analysis

Open HCS-3.
Click on the *Weaving* button.
Click on the *New* button.
Choose Type A, Type B or Type C (refer to HCM Table 4-1, HCM Figures 4-3, 4-4, 4-5 or Help Menu.)
Check Multilane Highway or Collector-Distributor, if applicable. Click *OK*.

- Multilane Highway – Facility with driveway connections and/or at-grade intersections.
- Collector-Distributor – Facility that provides a barrier between freeway (non-weaving vehicles) and the weaving section.

Enter the general information.
Enter the Length of Weaving Section (approximate gore-to-gore distance, limited to 2500 feet maximum.)
Enter the Number of Lanes (lanes inside the weaving area.)
Enter the Free Flow Speed (ideal freeway situations = 65mph, collector-distributors = 45mph, or make adjustment to speed limit.)
Enter Terrain Type.
Enter volumes (V_{A-C} is the freeway non-weaving vehicles.)
Enter the PHF = 0.90.
Enter % Trucks and Buses (remember to divide the statewide percentages by two.)
Enter % RVs = 0.
Enter f_P = 1.00.
Print Analysis.
Check Weaving Area Limitations to ensure that none of the limitations specified are exceeded. Where any limits are exceeded, consult the appropriate notes near the bottom of the output.

Procedural Check List for HCS-3 Ramps Analysis

Open HCS-3.
Click on the *Ramps* button.
Click on the *New* button.
Choose Merge or Diverge. Click *OK*.
Enter the general information.
Enter the Number of Lanes on Freeway per direction.
Enter the Free Flow Speed (ideal freeway situations = 65mph.)
Enter the volume (freeway volume immediately upstream of the analysis ramp is used.)
Choose Left or Right side of freeway (typically right side.)
Enter the Free Flow Speed of Ramp (typically 45 mph for ramps, 25 mph for loops.)
Enter the Ramp Volume.
Enter Number of Lanes on Ramp.
Enter the Acceleration/Deceleration Length (measured from gore to end of taper. For two-lane ramps, LA1 or LD1 is the length of section that includes two-ramp lanes.)

Choose Yes or No for adjacent ramps. (This is marked Yes if an adjacent ramp exists within 6000 feet of an analyzed on-ramp along a six-lane freeway or within 1400 feet of an analyzed off-ramp. Otherwise, mark No. If both upstream and downstream adjacent ramps exist, the analysis must be run twice.)
If there is an adjacent ramp:

- Choose Upstream or Downstream adjacent ramp.
- Choose Type of Adjacent Ramp.
- Enter Distance to Adjacent Ramp.
- Enter Volume of Adjacent Ramp.

Enter the PHF = 0.90.
Enter Terrain Type.
Enter % Trucks and Buses (remember to divide the statewide percentages by two.)
Enter % RVs = 0.
Enter f_P = 1.00.
If analysis indicates an “F” LOS, review Capacity Checks. If they pass, extending the ramp acceleration/deceleration lengths could improve the LOS.
Print Analysis.

Procedural Check List for HCS-3 Multilane Analysis

Open HCS-3.
Click on the *Multilane* button.
Click on the *New* button.
Choose Operations, Design or Planning. Click *OK*.

- Operations – Will typically solve for Level of Service (LOS) for a given set of volume, speed and geometric conditions
- Design – Will typically solve for the necessary Number of Lanes for a desired LOS and a given set of volume, speed and geometric conditions.
- Planning – Will typically solve for LOS for either a 4-lane or 6-lane design from a given set of conditions, including assumed defaults and volume generated from AADT-level information.

Operations and Design Analysis

Enter the general information.
For Design Analysis only, enter the Desired LOS.
Indicate Ideal Free Flow Speed.
Enter the Free Flow Speed (increase 40 and 45 mph speed limit by 7 mph; increase 50 and 55 mph speed limit by 5 mph.)
Enter Lane Width (normally 12 feet.)
Enter Lateral Clearance (normally 6 feet.)
Enter the Access points/mile. (This includes right-side only access points. If no information is available, use 10 for rural sections and 20 for urban sections. If there is potential for rural section to become urban by design year, use 20.)
Enter Volume.
Enter PHF (0.90 for urban, 0.85 for rural.)
For Operations Analysis only, enter the Number of Lanes for each direction.
Enter Terrain Type.
Enter % Trucks and Buses (remember to divide the statewide percentages by two.)
Enter % RVs = 0.
Enter f_P = 1.00 (for recreational facilities, value may be decreased; see HCM Table 3-7.)
Print Analysis.
For Design Analysis, round results up to nearest whole number.

Planning Analysis *

Enter the general information.
Enter the AADT, K (DHV) and D.
Enter % Trucks (remember to divide the statewide percentages by two.)
Enter Terrain Type.
Enter the Free Flow Speed (increase 40 and 45 mph speed limit by 7 mph; increase 50 and 55 mph speed limit by 5 mph.)
Print Analysis.

*Planning Assumptions:

All heavy vehicles are trucks.
PHF = 0.90
Lane widths = 12 ft
Access points = 20 per mile, each side.
Shoulder width > 6 ft
Divided highway

Procedural Check List for HCS-3 Two-Lane Analysis

Open HCS-3.
Click on the *Two-Lane* button.

1. Select Begin New Problem
2. Select Identifying Information
   Enter general information.
3. Select Terrain
   Select terrain type.
4. Select Vols/Passing Zones
   Enter 100% no passing zones.
   Enter the total volume for both directions (ADT X DHV.)
5. Select Adjustment Factors
   Enter % Trucks (remember to divide the statewide percentages by two.)
   Enter % Buses = 0.
   Enter % RVs = 0.
   Enter Design Speed (50 mph – 60 mph.)
   Enter PHF = 0.90.
   Enter Directional Distribution.
   Enter Lane Width (normally 12 feet.)
   Enter Shoulder Width (normally 6 feet.)
6. Select Disk Data Management
   Save file.
7. Select Perform Calculations
   Accept the default values.
   Type Y to generate a report.
   Type 1 to print.